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New Staphylinidae (Coleoptera) records with new collection data from New Brunswick, Canada: Oxyporinae

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Abstract

Five species of Oxyporinae: *Oxyporus occipitalis* Fauvel, *Oxyporus quinquemaculatus* LeConte, *Oxyporus. major* Gravenhorst, *Oxyporus rufipennis* LeConte, and *Oxyporus stygicus* Say, are newly recorded from New Brunswick, bringing the number of Oxyporinae known from the province to eight. The first documented records from New Brunswick are provided for *Oxyporus kiteleyi* reported by Majka et al. (2011). *Oxyporus occipitalis* and *O. major* are newly reported for the Maritime provinces of Canada. Collection and habitat data are presented for all these species.

Keywords

Staphylinidae, Oxyporinae, new records, Canada, New Brunswick

Introduction

This paper treats new Staphylinidae records from New Brunswick of the subfamily Oxyporinae. The Oxyporinae of the New World were reviewed by Campbell (1969, 1978). This Subfamily includes only the genus *Oxyporus* in North America. The biology and larva have been described for a number of the North American species (McCabe and Teale 1982; Leschen and Allen 1988; Hanley and Goodrich 1993, 1994; Goodrich and Hanley 1995b). Members of this genus exhibit an obligate association with mature Agaricales (gilled), Boletales (bolete), and Polyporales (polypore) mushrooms, and both larvae and adults feed on the spore-producing layer of the mushrooms (Hanley and Goodrich 1995b). The host preferences and behavior of the New World

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Oxyporus species were reviewed by Hanley and Goodrich (1995b). Members of this genus vary in the range of fungal host genera they use. For example, adults of *Oxyporus quinquemaculatus* LeConte have a narrow host preference range (*Pluteus* species), whereas other species, such as *Oxyporus vittatus* Gravenhorst, use a broad range of host genera of fungi, although the larvae of all species appear to have a narrower range of host species than the adults and are usually found in only one or two host fungi (Hanley and Goodrich 1995a, b). The short duration of the life cycle of only 14–17 days is probably an adaptation related to the ephemeral nature of the host fungi (Hanley and Goodrich 1993, 1994, 1995b; Goodrich and Hanley 1995).

Campbell and Davies (1991) reported eight species of *Oxyporus* for Canada and two species (*Oxyporus. lateralis* Gravenhorst and *O. vittatus*) from New Brunswick. Majka et al. (2011) reported *Oxyporus kiteleyi* Campbell from New Brunswick but did not provide any supporting references or data. Here, five species are added to the faunal list of New Brunswick, and the first documented records from New Brunswick of *O. kiteleyi*, bringing the number of Oxyporinae known from the province to eight.

Methods and conventions

The following records are based in part on specimens collected as part of a general survey by the first author to document the Coleoptera fauna of New Brunswick.

Collection methods

Oxyporinae were collected from mushrooms. Mushrooms were placed in a plastic box, broken into pieces, and the adults aspirated into a vial. A description of the habitat was recorded for all collections. Locality and habitat data are presented exactly as on labels for each record. This information, as well as additional collecting notes, is summarized in the collection and habitat data section for each species.

Specimen preparation

A few examples of male specimens were dissected to confirm their identity. The genital structures were dehydrated in absolute alcohol and mounted in Canada balsam on celluloid microslides, and pinned with the specimens from which they originated.

Distribution

Distribution maps, created using ArcMap and ArcGIS, are presented for each species in New Brunswick. Every species is cited with current published distribution in

Canada and Alaska, using abbreviations for the state, provinces, and territories. New provincial records are indicated in bold under Distribution in Canada and Alaska. The following abbreviations are used in the text:

AK	Alaska	**MB**	Manitoba
YT	Yukon Territory	**ON**	Ontario
NT	Northwest Territories	**QC**	Quebec
NU	Nunavut	**NB**	New Brunswick
BC	British Columbia	**PE**	Prince Edward Island
AB	Alberta	**NS**	Nova Scotia
SK	Saskatchewan	**NF & LB**	Newfoundland and Labrador

Acronyms of collections examined and referred to in this study are as follows:

AFC Atlantic Forestry Centre, Natural Resources Canada, Canadian Forest Service, Fredericton, New Brunswick, Canada
CNC Canadian National Collection of Insects, Arachnids and Nematodes, Agriculture and Agri-Food Canada, Ottawa, Ontario, Canada
NBM New Brunswick Museum, Saint John, New Brunswick, Canada
RWC Reginald P. Webster Collection, Charters Settlement, New Brunswick, Canada

Results

Five species of Oxyporinae are newly recorded from New Brunswick, and the first documented records from New Brunswick of *O. kiteleyi*, bringing the number of Oxyporinae known from the province to eight (Table 1).

Table 1. Species of Oxyporinae (Staphylinidae) recorded from New Brunswick, Canada.

Family Staphylinidae Latreille	*Oxyporus* (*Oxyporus*) *kiteleyi* Campbell
Subfamily Oxyporinae Fleming	*Oxyporus* (*Oxyporus*) *major* Gravenhorst**
Oxyporus (*Pseudoxyporus*) *lateralis* Gravenhorst	*Oxyporus* (*Oxyporus*) *rufipennis* LeConte*
Oxyporus (*Pseudoxyporus*) *occipitalis* Fauvel**	*Oxyporus* (*Oxyporus*) *stygicus* Say*
Oxyporus (*Pseudoxyporus*) *quinquemaculatus* LeConte*	*Oxyporus* (*Oxyporus*) *vittatus* Gravenhorst

Notes. *New to province, **New to Maritime provinces.

Species accounts

All records below are species newly recorded for New Brunswick, Canada, unless noted otherwise (additional records). Species followed by ** are newly recorded from the Maritime provinces (New Brunswick, Nova Scotia, Prince Edward Island) of Canada.

The classification of the Oxyporinae follows Bouchard et al. (2011).

Family Staphylinidae, Latreille, 1802
Subfamily Oxyporinae, Fleming, 1821

Oxyporus* (*Pseudoxyporus*) *occipitalis* Fauvel, 1864*
http://species-id.net/wiki/Oxyporus_occipitalis
Map 1

Material examined. New Brunswick, Carleton Co., Meduxnekeag River Valley Nature Preserve, 46.1907°N, 67.6740°W, 23.VI.2006, R. P. Webster, mixed forest, in gilled mushroom (2 ♂, 5 ♀, RWC); Meduxnekeag River Valley Nature Preserve, 46.1940°N, 67.6800°W, 3.VII.2006, R. P. Webster, mixed forest, in gilled mushroom (1 ♂, 3 ♀, RWC).

Collection and habitat data. The biology, life history, and fungal hosts of *Oxyporus occipitalis* were reported by Hanley and Goodrich (1993, 1995a, b). This species was reported from 11 genera in seven families of fungi, but most individuals were reported from four genera (Hanley and Goodrich 1993, 1995a, b). In New Brunswick, adults were collected from various species (species not determined) of gilled mushrooms in mixed forests during June and July.

Distribution in Canada and Alaska. YT, BC, AB, SK, MB, ON, QC, **NB** (Campbell 1969).

***Oxyporus* (*Pseudoxyporus*) *quinquemaculatus* LeConte, 1863**
http://species-id.net/wiki/Oxyporus_quinquemaculatus
Map 2

Material examined. New Brunswick, Albert Co., Caledonia Gorge P.N.A., (Protected Natural Area) 45.8257°N, 64.7791°W, 6.VII.2011, R. P. Webster, old hardwood forest (sugar maple and beech), on *Polyporus varius* (1, RWC). **Carleton Co.**, Meduxnekeag River Valley Nature Preserve, 46.1907°N, 67.6740°W, 23.VI.2006, R. P. Webster, mixed forest, in gilled mushroom (1 ♀, RWC); Meduxnekeag River Valley Nature Preserve, 46.1897°N, 67.6710°W, 25.VI.2007, R. P. Webster, mixed forest, in gilled mushroom (1 ♂, RWC); Meduxnekeag River Valley Nature Preserve, 46.1898°N, 67.6766°W, 2.VI.2008, R. P. Webster, mixed forest, in small brown gilled mushrooms on side of rotten log (3 ♂, RWC). **York Co.**, Charters Settlement, 45.8286°N, 66.7365°W, 11.VII.2006, 2.VI.2007, R. P. Webster, mature mixed forest, in gilled mushrooms (2 ♂, 1 ♀, RWC).

Collection and habitat data. *Oxyporus quinquemaculatus* has a relatively narrow range of hosts (five genera in three families), with most records from the genus *Pluteus* (Hanley and Goodrich 1995b). This species was also reported from *Laccaria amethystina* Murr., *Psilocybe spadicea* Fries, and *Naematoloma sublateritium* Karst. by Weiss and West (1920, 1921). In New Brunswick, this species was collected from gilled mushrooms (species not determined) and from *Polyporus varius* Fr. in mixed forests during June and July.

Distribution in Canada and Alaska. ON, QC, **NB**, NS (Campbell 1969).

***Oxyporus* (*Oxyporus*) *kiteleyi* Campbell, 1978**
http://species-id.net/wiki/Oxyporus_kiteleyi
Map 3

Material examined. Additional New Brunswick records, Carleton Co., Meduxnekeag River Valley Nature Preserve, 46.1907°N, 67.6740°W, 19.VIII.2004, 8.VIII.2006, R. P. Webster, mixed forest, in *Boletus* sp. mushrooms (2 ♂, 1 ♀, RWC); Meduxnekeag River Valley Nature Preserve, 46.1896°N, 67.6700°W, 26.IX.2007, R. P. Webster, hardwood forest, on group of *Pholiota* sp. mushrooms at base of dead standing beech (1 ♀, RWC); Meduxnekeag River Valley Nature Preserve, 46.1878°N, 67.6705°W, 18.VIII.2008, R. P. Webster, hardwood forest, in large orange gilled mushrooms [probably *Gymnopilus spectabilis*] near base of dead standing beech tree (5 ♂, 6 ♀, RWC, NBM); same locality and collector, 2.IX.2008, hardwood forest, on large orange gilled mushroom [probably *Gymnopilus spectabilis*] on side of rotten beech log (2 ♂, RWC); Jackson Falls, Bell Forest, 46.2200°N, 67.7231°W, 7.VIII.2009, R. P. Webster, mature hardwood forest, on large orange gilled mushroom [probably *Gymnopilus spectabilis*] on side of rotten beech log (7, NBM, RWC).

Collection and habitat data. Hanley and Goodrich (1995b) considered *O. kitelyi* to have a relatively narrow range of host species. Adults have been reported from *Suillus* sp. (Boletaceae) from Massachusetts and Georgia (Campbell 1978) and *Armillaria mellea* (Tricholomataceae) (Hanley and Goodrich 1995b). In New Brunswick, adults were found on *Boletus* sp. mushrooms (Boletaceae), *Pholiota* sp. (Cortinariaceae) at the base of standing dead American beech (*Fagus grandifolia* Ehrh.), and inside a large orange-gilled mushroom species (probably *Gymnopilus spectabilis* (Cortinariacae)) near bases of dead standing American beech trees or on rotten beech logs. Adults occurred in tunnels within the caps of the orange-gilled mushroom species. This species was collected during August and September.

Distribution in Canada and Alaska. QC, NB (Campbell 1978). *Oxyporus kiteleyi* was listed as occurring in New Brunswick by Majka et al. (2011) without any supporting references or data. Here, we provide the first documented records from New Brunswick.

Oxyporus* (*Oxyporus*) *major* Gravenhorst, 1806*
http://species-id.net/wiki/Oxyporus_major
Map 4

Material examined. New Brunswick, Carleton Co., Meduxnekeag River Valley Nature Preserve, 46.1907°N, 67.6740°W, 19.VIII.2004, 7.IX.2004, 14.IX.2005, R. P. Webster, mixed forest, in *Boletus* sp. mushrooms (3 ♂, 2 ♀, RWC).

Collection and habitat data. Campbell (1969) reported this species from a *Lactarius* sp. (Russulaceae). The biology, development, and a description of the larva of *O. major* were reported by Goodrich and Hanley (1995b). They reported this species from six families of fungi. Adults were most frequently collected from *Stropaharia hardii* Atkinson (Strophariaceae), *Lepiota acutaesquamosa* (Weinm.) Kummer (Lepiotaceae), and *Armillaria* spp. (Tricholomataceae). The only known larval host is *S. hardii* and *L.*

acutaesquamosa (Goodrich and Hanley 1995a, b). In New Brunswick, *O. major* was collected from *Boletus* sp. (Boletaceae) mushrooms during July, August, and September.

Distribution in Canada and Alaska. QC, **NB** (Chagnon 1917). Campbell (1969) considered a record from Montreal, Quebec based on specimens in the Fauvel Collection as doubtful unless verified by additional collecting and, therefore, did not report this species from Canada. However, there was a record supported by a specimen from Quebec (Montreal Island) reported by Chagnon (1917) that confirmed the presence of this species for the province of Quebec and Canada. There are also recent specimens from Quebec in the R. Martineau Collection at the Laurentian Forestry Centre's Insectarium in Quebec City, Quebec and in the CNC.

Oxyporus (*Oxyporus*) *rufipennis* LeConte, 1863

http://species-id.net/wiki/Oxyporus_rufipennis

Map 5

Material examined. New Brunswick, Albert Co., Caledonia Gorge P.N.A., 45.7692°N, 64.8093°W, 12.IX.2011, R. P. Webster, old hardwood forest (sugar maple and yellow birch), on *Pholiota* sp. mushrooms on yellow birch log (1, NBM). **Carleton Co.**, Meduxnekeag River Valley Nature Preserve, 46.1940°N, 67.6800°W, 23.VI.2006, 3.VII.2006, R. P. Webster, mixed forest, on *Pleurotus* sp. on dead standing trembling aspen (2 ♂, NBM, RWC). **Restigouche Co.**, Mount Carleton Prov. Park, Mount Bailey, 47.4042°N, 66.9189°W, 3.IX.2006, R. P. Webster, old hardwood forest, on mass of *Pholiota* sp. mushrooms on large dead standing yellow birch (5 ♂, 4 ♀ (over 50 individuals observed), RWC).

Collection and habitat data. Hanley and Goodrich (1995b) considered *O. rufipennis* to have a relatively narrow range of host species (*Pholiota* (Cortinariaceae), Polyporus (Polyoraceae), *Omphalotus*, *Pleurotus* (Tricholomataceae)). In New Brunswick, this species was collected from mushrooms on standing trees and a recently fallen tree: *Pleurotus* sp. mushrooms on dead standing trembling aspen (*Populus tremuloides* Michx.), from masses of *Pholiota* sp. mushrooms on a large standing (partially dead) yellow birch (*Betula alleghaniensis* Britt.), and a recently fallen yellow birch. Adults were captured during June, July, and September.

Distribution in Canada and Alaska. ON, QC, **NB**, NS (Campbell 1969; Campbell and Davies 1991).

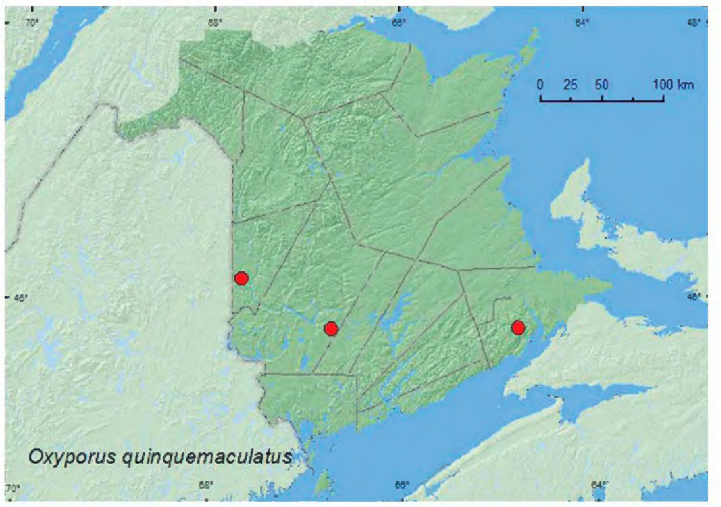
Oxyporus (*Oxyporus*) *stygicus* Say, 1831

http://species-id.net/wiki/Oxyporus_stygicus

Map 6

Material examined. New Brunswick, Carleton Co., Meduxnekeag River Valley Nature Preserve, 46.1940°N, 67.6800°W, 23.VI.2006, R. P. Webster, mixed forest, in

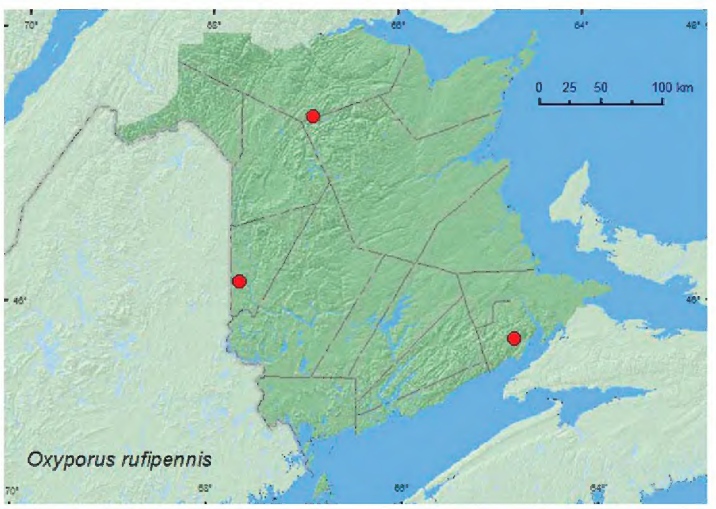
Map 1. Collection localities in New Brunswick, Canada of *Oxyporus occipitalis*.



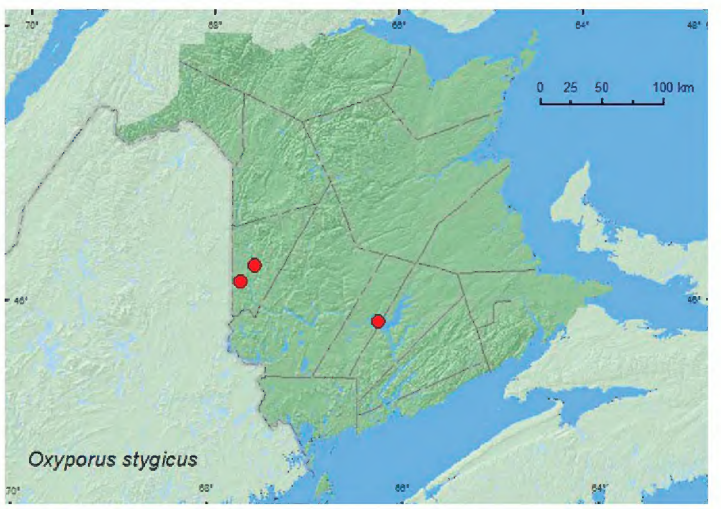
Map 2. Collection localities in New Brunswick, Canada of *Oxyporus quinquemaculatus*.

Map 3. Collection localities in New Brunswick, Canada of *Oxyporus kiteleyi*.

Map 4. Collection localities in New Brunswick, Canada of *Oxyporus major*.



Map 5. Collection localities in New Brunswick, Canada of *Oxyporus rufipennis*.



Map 6. Collection localities in New Brunswick, Canada of *Oxyporus stygicus*.

Boletus sp. mushrooms (2 ♂, 1 ♀, RWC); Becaguimec Island in Saint John River, 46.3106°N, 67.5392°W, 13.IX.2006, R. P. Webster, mature mixed forest, on *Pholiota* sp. mushrooms on log (1 ♂, 3 ♀, NBM, RWC). **Sunbury Co.**, Lakeville Corner, 45.9007°N, 66.2423°W, 10.IX.2006, R. P. Webster, silver maple forest, on *Boletus* sp. mushroom (2 ♂, RWC).

Collection and habitat data. The biology, development, and a description of the larval characteristics of *O. stygicus* were reported by Hanley and Goodrich (1994). They reported this species from three families of fungi: Cortinariaceae (*Pholiota*), Polyporaceae (*Grifola, Polyporus*), and Tricholomataceae (*Armillaria, Omphalotus*, *Pleurotus*). Large series of immatures were collected from *Pholiota aurivella* (Fr.) Kummer, *Pholiota* sp., and *Omphalotus illudens* (Schw.) Bigelow. Weiss and West (1920) reported *O. stygicus* from *Pleurotus ostriatus* Fries. Hanley and Goodrich (1995b) considered *O. stygicus* to have a relatively narrow range of host species compared with other *Oxyporus* sp. This species was collected from *Boletus* and *Pholiota* spp. mushrooms in mixed forests and a silver maple (*Acer saccharum* Marsh) forest in New Brunswick. Adults were collected during June and September.

Distribution in Canada and Alaska. QC, **NB**, NS (Campbell 1969).

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